

Name: KEY Hour: \_\_\_\_\_ Date: \_\_\_\_\_

## NOTES: Section 10.3 – Special Products of Polynomials

Goals: #1 - I can use special product patterns to multiply polynomials. 😎 😐 😞

Homework: Section 10.3 Worksheet

Warm Up: Find the product.

1.  $-3x^2(3x^2 - 4x + 5)$   
 $-3x^2(3x^2) - 3x^2(-4x) - 3x^2(5)$   
 $-9x^4 + 12x^3 - 15x^2$

2.  $(y + 6)(4y - 3)$   
 $y(4y) + y(-3) + 6(4y) + 6(-3)$   
 $4y^2 - 3y + 24y - 18$   
 $4y^2 + 21y - 18$

Notes:

A Binomial is the sum of two monomials.

Examples:  $y + 6$ ,  $4y - 3$

There are special types of binomials:

• Sum and Difference Pattern:  
 $(a + b)(a - b)$

• square of a Binomial Pattern:

$$(a + b)^2 = (a + b)(a + b)$$

$$(a - b)^2 = (a - b)(a - b)$$

We have to be very careful when multiplying these, but we STILL distribute!

Example #1: Find the product.

1.  $(5t - 2)(5t + 2)$

$$5t(5t) + 5t(2) - 2(5t) - 2(2)$$

$$25t^2 + 10t - 10t - 4$$

$$\boxed{25t^2 - 4}$$

2.  $(n - 3)(n + 3)$

$$n(n) + n(3) - 3(n) - 3(3)$$

$$n^2 + 3n - 3n - 9$$

$$\boxed{n^2 - 9}$$

Example #2: Find the product.

1.  $(3n + 4)^2$

$$(3n + 4)(3n + 4)$$

$$3n(3n) + 3n(4) + 4(3n) + 4(4)$$

$$9n^2 + 12n + 12n + 16$$

$$\boxed{9n^2 + 24n + 16}$$

2.  $(4x - 1)^2$

$$(4x - 1)(4x - 1)$$

$$4x(4x) + 4x(-1) - 1(4x) - 1(-1)$$

$$16x^2 - 4x - 4x + 1$$

$$\boxed{16x^2 - 8x + 1}$$

You practice: Find the product.

1.  $(2x - 1)(2x + 1)$

$$2x(2x) + 2x(1) - 1(2x) - 1(1)$$

$$4x^2 + 2x - 2x - 1$$

$$\boxed{4x^2 - 1}$$

2.  $(3a - 4)^2$

$$(3a - 4)(3a - 4)$$

$$3a(3a) + 3a(-4) - 4(3a) - 4(-4)$$

$$9a^2 - 12a - 12a + 16$$

$$\boxed{9a^2 - 24a + 16}$$

3.  $(x + 1)^2$

$$(x + 1)(x + 1)$$

$$x(x) + x(1) + 1(x) + 1(1)$$

$$x^2 + x + x + 1$$

$$\boxed{x^2 + 2x + 1}$$

4.  $(3x + 2)(3x + 2)$

$$3x(3x) + 3x(2) + 2(3x) + 2(2)$$

$$9x^2 + 6x + 6x + 4$$

$$\boxed{9x^2 + 12x + 4}$$